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EXAMINER	
DANIELS, ANTHONY J	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

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Office Action Summary	Application No.	Applicant(s)	
	09/991,985	AKIYOSHI ET AL.	
	Examiner	Art Unit	
	Anthony J. Daniels	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 11/26/01

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 1-17 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: On page 2 Line 15, the term "data" should follow "...of".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,2,4,5,7,8,10,11,13,14,22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchino (US 20020080148) in view of Shinagawa et al. (US #6,137,910).

As to claim **1**, Uchino teaches a digital camera (see Figure 8, camera "200"), comprising an image pick-up unit, which captures images (see Figure 9, CCD "242"); a camera controller (see Figure 9, CPU "211"), which controls said image pick-up unit so that at a first image and a second image are captured by said image pick-up unit at predetermined intervals (see [0039], Lines 9-14); and a processor (see Figure 1, differential image generator "11") that computes a relationship between the first image and the second image, similar to matching which is used to calculate optical (see Figure 1, flash emission data "34") and depth parameters (see [0072]), and outputs that information as a corresponding point file (differential image data "33"). The claim differs from Uchino in that it requires the task of matching to be performed between the first image and the second image.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Uchino the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Uchino is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al. using the processor in Uchino; noting also adaptable software (see Figure 9, ROM program "212a") to the camera taught by Uchino.

As to claim **2**, Uchino teaches a digital camera (Figure 8, camera "200"), comprising: an image pick-up unit, which captures images (see Figure 9, CCD "242"); a camera controller (see Figure 9, CPU 211), which determines two images among images captured by said image pick-up unit, as a first image and a second image (see [0039], Lines 4-6; see Figure 9, RAM "230"); and a processor (see Figure 1, differential image generator "11") that computes a relationship between the first image and the second image, similar to matching which is used to calculate optical (see Figure 1, flash emission data "34") and depth parameters (see [0072]), and outputs that information as a corresponding point file (differential image data "33"). The claim differs from Uchino in that it requires the task of matching to be performed between the first image and the second image.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by

Uchino the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Uchino is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al. using the processor in Uchino; noting also adaptable software (see Figure 9, ROM program "212a") to the camera taught by Uchino.

As to claim **4**, Uchino, as modified by Shinagawa et al., teaches a digital camera according to claim 1 (see 103(a) rejection above), further comprising an intermediate image generator (see Figure 1, image regenerator "13"), which generates an intermediate image between the first image and the second image based on the corresponding point file (see Figure 1, *{The differential image data is used to calculate the object color component data which is used to generate the image from the image regenerator; thus, showing there is a basis on differential image data for intermediate image generation.}*).

As to claim **5**, the limitations in claim 5 can be found in claim 4. Therefore, claim 5 is analyzed and rejected as previously discussed with respect to claim 4.

As to claim **7**, Uchino, as modified by Shinagawa et al., teaches a digital camera according to claim 4 (see 103(a) rejection above), further comprising a display unit (see Figure 8, display "221") for displaying the first image, the second image, and the intermediate image (see Figure 1, *{It stands to reason that a display on a camera can display images that are stored on the camera.}*).

As to claim **8**, the limitations in claim 8 can be found in claim 7. Therefore, claim 8 is analyzed and rejected as previously discussed with respect to claim 7.

As to claim **10**, Uchino, as modified by Shinagawa et al., teaches a digital camera according to claim 4 (see 103(a) rejection above), further comprising a storage unit (see Figure 1, RAM "30") that stores the first image, the second image, and the corresponding point file in a manner such that the first image, the second image, and the corresponding point file are associated with one another (see Figure 1, RAM "30"). *The association is being interpreted as being stored in the storage unit in close proximity to one another.*

As to claim **11**, the limitations in claim 11 can be found in claim 10. Therefore, claim 11 is analyzed and rejected as previously discussed with respect to claim 10.

As to claim **13**, Uchino, as modified by Shinagawa et al., teaches a digital camera according to claim 1 (see 103(a) rejection above), wherein said matching processor computes the matching result by detecting points on the second image (see Figure 3, Points A`,B`,C`,D` of "Destination Image")) that correspond to lattice points on a mesh provided on the first image (see Figure 3, Points A,B,C,D of Source Image), and based on a thus detected correspondence determines a destination polygon in the second image (see Figure 3, Inherited Quadrilateral (A`B`C`D`)) corresponding to a source polygon of the mesh on the first image (see Figure 3, Quadrilateral of Source Image) (see Col. 10, Lines 64-67; Col. 11, Lines 1-4).

As to claim **14**, the limitations in claim 14 can be found in claim 13. Therefore, claim 14 is analyzed and rejected as previously discussed with respect to claim 13.

As to claim **22**, Uchino fail to teach a mode setting unit for setting a simplified motion picture shooting mode in said pick-up unit. **Official Notice** is taken that mode setting units for setting a simplified motion picture shooting mode in said image pick-up unit are well known and expected in the art. It would have been obvious to have included such a mode setting unit in

Uchino's camera, because cameras that take both still and motion pictures need to be instructed as to what mode is desired.

As to claim **23**, Uchino teaches a digital camera (see Figure 8, camera "200"), comprising: an image pick-up unit (see Figure 9, CCD "242") which acquires a first image and a second image (see [0039], Lines 9-14); and a processor (see Figure 1, differential image generator "11") that computes a relationship between the first image and the second image, similar to matching which is used to calculate optical (see Figure 1, flash emission data "34") and depth parameters (see [0072]). The claim differs from Uchino in that it requires the task of matching to be performed between the first image and the second image; wherein said matching defines a destination polygon on the second image, which corresponds to a source polygon on the first image.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9); wherein said matching defines a destination polygon on the second image which corresponds to a source polygon on the first image (see Figure 3, Inherited Quadrilateral (A`B`C`D`) on destination image, Quadrilateral (ABCD) on source image). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Uchino the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Uchino is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al.

using the processor in Uchino; noting also adaptable software (see Figure 9, ROM program "212a") to the camera taught by Uchino.

As to claim **24**, Uchino teaches a digital camera (Figure 8, camera "200"), comprising: an image pick-up unit, which captures images (see Figure 9, CCD "242"); a camera controller (see Figure 9, CPU 211), which determines two images among images captured by said image pick-up unit, as a first image and a second image (see [0039], Lines 4-6; see Figure 9, RAM "230"); and a processor (see Figure 1, differential image generator "11") that computes a relationship between the first image and the second image, similar to matching which is used to calculate optical (see Figure 1, flash emission data "34") and depth parameters (see [0072]), and outputs that information as a corresponding point file (differential image data "33"). The claim differs from Uchino in that it requires the task of matching to be performed between the first image and the second image, and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the multiresolution hierarchy.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9) and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the

multiresolution hierarchy (see Col. 3, Lines 42-55). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Uchino the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Uchino is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al. using the processor in Uchino; noting also adaptable software (see Figure 9, ROM program "212a") to the camera taught by Uchino.

As to claim **25**, Uchino teaches a digital camera (Figure 8, camera "200"), comprising: an image pick-up unit, which captures images (see Figure 9, CCD "242"); a camera controller (see Figure 9, CPU 211), which determines two images among images captured by said image pick-up unit, as a first image and a second image (see [0039], Lines 4-6; see Figure 9, RAM "230"); and a processor (see Figure 1, differential image generator "11") that computes a relationship between the first image and the second image, similar to matching which is used to calculate optical (see Figure 1, flash emission data "34") and depth parameters (see [0072]), and outputs that information as a corresponding point file (differential image data "33"). The claim differs from Uchino in that it requires the task of matching to be performed between the first image and the second image and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the multiresolution hierarchy.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9) and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the multiresolution hierarchy (see Col. 3, Lines 42-55). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Uchino the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Uchino is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching in Shinagawa et al. using the processor in Uchino; noting also adaptable software (see Figure 9, ROM program "212a") to the camera taught by Uchino.

4. Claims 3,6,9,15,26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. (US 20020113865) in view of Shinagawa et al. (see Patent Number above).

As to claim **3**, Yano et al. teaches a digital camera (see [0146]), comprising: an image pick-up unit (see Figure CCD "203" & "204"), which comprises a stereo view (see Figure 2, stereo camera "200"); a camera controller (see Figure 2, image capture controllers "205" & "206") which controls said image pick-up unit so that a first image and a second image which constitute a stereo image are captured by said image pick-up unit (see [0042]); and a processor

(see Figure 1, parallax extracting portion "110") that computes a relationship between the first image and the second image, similar to matching which is used to calculate depth parameters (see [0044]), and outputs that information as a corresponding point file (see [0039], Lines 13-16). The claim differs from Yano et al. in that it requires the task of matching to be performed between the first image and the second image.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9). In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Yano et al. the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Yano et al. is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al. using the processor in Yano et al.

As to claim **6**, Yano et al., as modified by Shinagawa et al., teaches a digital camera according to claim 3 (see 103(a) rejection above), further comprising an intermediate image generator (see Figure 1, virtual image generating portion "150") which generates an intermediate image between the first image and the second image based on the corresponding point file (see Figure 1, *{The parallax extracting data is used to calculate the object model approximating data which data is used to calculate the model generating data which is used to generate the virtual image; thus, there is a basis on parallax extracting data for generating the intermediate image.}*).

As to claim **9**, Yano et al., as modified by Shinagawa et al., teaches a digital camera according to claim 4 (see 103(a) rejection above), further comprising a display unit (see Figure 1, display "170") for displaying the first image, the second image, and the intermediate image (see Figure 1, *{It stands to reason that a display on a camera can display images that are stored on the camera.}*).

As to claim **15**, Yano et al., as modified by Shinagawa et al., teaches a digital camera according to claim 3 (see 103(a) rejection above), wherein said matching processor computes the matching result by detecting points on the second image (see Figure 3, Points A`,B`,C`,D` of "Destination Image")) that correspond to lattice points on a mesh provided on the first image (see Figure 3, Points A,B,C,D of Source Image), and based on a thus detected correspondence determines a destination polygon in the second image (see Figure 3, Inherited Quadrilateral (A`B`C`D`)) corresponding to a source polygon of the mesh on the first image (see Figure 3, Quadrilateral of Source Image) (see Col. 10, Lines 64-67; Col. 11, Lines 1).

As to claim **26**, Yano et al. teaches a digital camera (see [0146]), comprising: an image pick-up unit (see Figure CCD "203" & "204"), which comprises a stereo view (see Figure 2, stereo camera "200"); a camera controller (see Figure 2, image capture controllers "205" & "206") which controls said image pick-up unit so that a first image and a second image which constitute a stereo image are captured by said image pick-up unit (see [0042]); and a processor (see Figure 1, parallax extracting portion "110") that computes a relationship between the first image and the second image, similar to matching which is used to calculate depth parameters (see [0044]), and outputs that information as a corresponding point file (see [0039], Lines 13-16). The claim differs from Yano et al. in that it requires the task of matching to be performed

between the first image and the second image and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the multiresolution hierarchy.

In the same field of endeavor, Shinagawa et al. teaches the task of matching between images (see Col. 3, Lines 56-67, Col. 4, Lines 1-9) and the matching task multiresolutionalizes the first image and the second image using critical points thereof to create a multiresolution hierarchy and then detects a correspondence relation between critical points starting from a coarser level in the multiresolution hierarchy and proceeding to finer levels to determine the matching hierarchy between the first image and the second image at a finest level in the multiresolution hierarchy. In light of the teaching of Shinagawa et al., it would have been obvious to one of ordinary skill in the art to provide the processor taught by Yano et al. the ability to perform the matching task taught by Shinagawa et al. This type of matching task allows for an optimal match to be detected (see Shinagawa et al., Col. 3, Lines 60-62, *Also see Col. 3, Lines 56-67; Col. 4 Lines 1-9)*). Since the processor in Yano et al. is performing a task similar to the one in Shinagawa et al., it would have been obvious to implement the task of matching taught in Shinagawa et al. by the processor in Yano et al.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. in view of Shinagawa et al. (see Patent Numbers above) and further in view of Uchino (see Patent Number above).

As to claim **12**, Yano et al., as modified by Shinagawa et al., teaches a digital camera according to claim 6 (see 103 (a) rejection above), further comprising a storage unit that stores the first image and the second image (see Figure 1, image memory "102" & "103"). The claim differs from Yano et al. in that it requires the storage of the corresponding point file and that the first image, the second image, and the corresponding point file are associated with one another.

In the same field of endeavor, Uchino teaches the storage of the first image, the second image, and the corresponding point file (see Figure 1, "31", "32", and "33") in RAM (see Figure 1, RAM "30") in close proximity to one another (see Figure 1, "31","32", and "33"; see statement in italics in claim 10). In light of the teaching of Uchino, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Yano et al. and Shinagawa et al. by storing the first image, the second image, and the corresponding point file in close proximity to one another. *The association is being interpreted as being stored in the storage unit in close proximity to one another.* Such an association will allow for swifter retrieval of information when the image regeneration is taking place; thereby, increasing the speed of the camera.

6. Claims 16,17,19,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchino and Shinagawa et al. (see Patent Number above) and further in view of Bell et al. (US #5,550,937)

As to claim **16**, Uchino et al., as modified by Shinagawa et al., teaches a digital camera according to claim 1 (see 103(a) rejection above), which contains a processor (see Uchino, Figure 1, differential image generator "11") which performs matching (see Shinagawa et al., see Col. 3, Lines 56-67, Col. 4, Lines 1-9). The claim differs from Uchino and Shinagawa et al. in that it requires that the matching processor performs pixel-by-pixel matching computation based on correspondence between a critical point detected through a two-dimensional search on the first image and a critical point detected through a two-dimensional search on the second image.

In the same field of endeavor, Bell et al. teaches a pixel-by-pixel matching computation based on a based on correspondence between a critical point detected through a two-dimensional search on the first image (see Figure 1, point "51-1") and a critical point detected through a two-dimensional search on the second image (see Figure 1, point "51-1"). (see Figure 6 and Figure 7; Col. 7, 36-60). In light of the teaching of Bell et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Uchino and Shinagawa et al. by performing such pixel to pixel matching. This type of matching allows for a more accurate matching between images; hence, a nobler interpolation of images would be achieved.

As to claim **17**, the limitations of claim 17 can be found in claim 16. Therefore, claim 17 is analyzed and rejected as previously discussed with respect to claim 16.

As to claim **19**, Uchino, as modified by Shinagawa et al. and Bell et al., teaches a digital camera according to claim 16 (see 103(a) rejection above), wherein said matching processor initially multiresolutionalizes the first image and the second image using the critical points (see Bell et al., Col. 2, Lines 17-33) then performs the pixel-by-pixel matching computation between related multiresolution levels while also inheriting a result of a pixel-by-pixel matching

computation at a different multiresolution level, in order to acquire a pixel-by-pixel correspondence relation at a finest resolution level at a final stage (see Bell et al., Col. 2, Lines 34-46).

As to claim **20**, the limitations of claim 20 can be found in claim 19. Therefore, claim 20 is analyzed and rejected as previously discussed with respect to claim 19.

7. Claims 18,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. and Shinagawa et al. (see Patent Numbers above) and further in view of Bell et al. (see Patent Number above).

As to claim **18**, Yano et al., as modified by Shinagawa et al. teaches a digital camera according to claim 3 (see 103(a) rejection above), which contains a processor (see Yano et al., Figure 1, parallax extraction portion "110") which performs matching (see Shinagawa et al., see Col. 3, Lines 56-67, Col. 4, Lines 1-9). The claim differs from Yano et al. and Shinagawa et al. in that it requires that the matching processor performs pixel-by-pixel matching computation based on correspondence between a critical point detected through a two-dimensional search on the first image and a critical point detected through a two-dimensional search on the second image.

In the same field of endeavor, Bell et al. teaches a pixel-by-pixel matching computation based on a based on correspondence between a critical point detected through a two-dimensional search on the first image (see Figure 1, point "51-1") and a critical point detected through a two-dimensional search on the second image (see Figure 1, point "51-1"). (see Figure 6 and Figure 7; Col. 7, 36-60). In light of the teaching of Bell et al., it would have been obvious to one of

ordinary skill in the art at the time the invention was made to modify Yano et al. and Shinagawa et al. by performing such pixel to pixel matching. This type of matching allows for a more accurate matching between images; hence, a nobler interpolation of images would be achieved.

As to claim **21**, Yano et al., as modified by Shinagawa et al. and Bell et al., teaches a digital camera according to claim 18 (see 103(a) rejection above), wherein said matching processor initially multiresolutionalizes the first image and the second image using the critical points (see Bell et al., Col. 2, Lines 17-33) then performs the pixel-by-pixel matching computation between related multiresolution levels while also inheriting a result of a pixel-by-pixel matching computation at a different multiresolution level, in order to acquire a pixel-by-pixel correspondence relation at a finest resolution level at a final stage (see Bell et al., Col. 2, Lines 34-46).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Daniels whose telephone number is (703) 305-4807. The examiner can normally be reached on 8:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andy Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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NGOC-YEN VU
PRIMARY EXAMINER